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| 10/572,586   | 03/20/2006  | Mineyuki Kubota      | 286945US0PCT        | 3390             |
| 22850  | 7590        | 09/29/2011           |                     |                  |
| OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.<br>1940 DUKE STREET<br>ALEXANDRIA, VA 22314 |             |                      |                     |                  |
| EXAMINER   |             |                      |                     |                  |
| GARRETT, DAWN L  |             |                      |                     |                  |
| ART UNIT   |             | PAPER NUMBER         |                     |                  |
| 1786   |             |                      |                     |                  |
| NOTIFICATION DATE  |             | DELIVERY MODE        |                     |                  |
| 09/29/2011   |             | ELECTRONIC           |                     |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/572,586

**Applicant(s)**

KUBOTA ET AL.

**Examiner**

Dawn L. Garrett

**Art Unit**

1786

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 June 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 5) ☒ Claim(s) 2-4 and 14-31 is/are pending in the application.
- 5a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 2-4 and 14-31 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF-03)  
Paper No(s)/Mail Date \_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action is responsive to the amendment received June 14, 2011. Claims 1 and 5-13 are cancelled. Claims 2-4 were amended. Claims 26-31 were newly added. Claims 2-4 and 14-31 are pending.
2. The rejection of claims 2-4 and 14-25 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention set forth in the last Office action (mailed February 14, 2011) is withdrawn due to the amendment filed June 14, 2011.
3. The rejection of claims 2-4 and 14-25 under 35 U.S.C. 102(e) as being anticipated by Cosimbescu et al. (US 2005/0089715 A1) is withdrawn.

### ***Claim Rejections - 35 USC § 102***

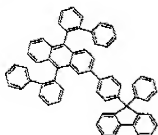
4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

5. Claims 2, 4, 15, 19, 20, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishida et al. (JP 2003-261472 A).

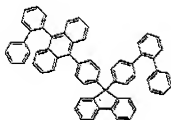
Ishida et al. discloses organic electroluminescent elements (see title and abstract). Ishida et al. exemplifies the following compounds for a device, which anticipate instant formulas (2) and (4):

A-21



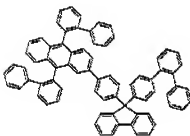
(page 11)

B-13



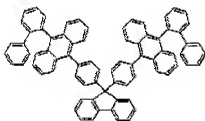
(page 14)

B-21



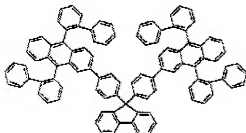
(page 15)

C-13



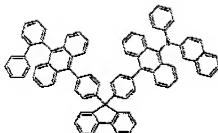
(page 19)

D-21



(page 21)

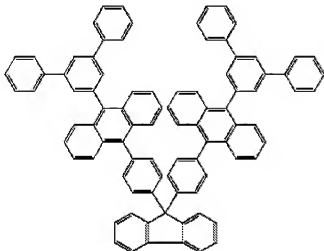
D-18



(page 25)

6. Claims 2, 3, 15, 17, 21, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Hu et al. (US 2002/0132134 A1).

Hu et al. discloses electroluminescent devices, which may comprise the following compounds (see abstract) anticipating formulas (2) and (3):



(see page 9)

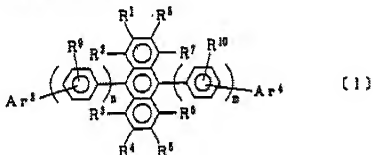
***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

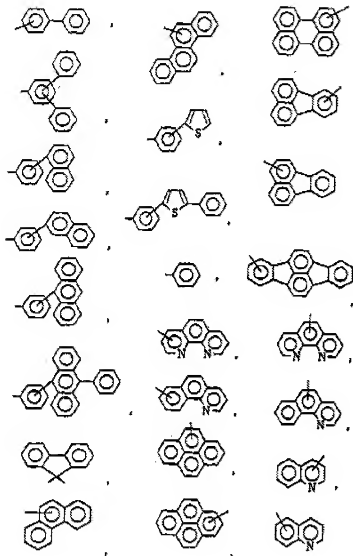
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2-4 and 14-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al. (EP 1333018 A1). Ikeda et al. teaches organic electroluminescent elements comprising diphenylanthracene compounds in at least one of the organic layers (see abstract).

**General formula [1]:**



In the general formula 1 compound above, each R may be hydrogen. The Ar groups are independently selected as substituted or unsubstituted aryl groups having 6 to 30 carbon atoms (see par. 8-9, page 3). The Ar groups are taught to include groups such as the following (see par 35, pages 7-8) per instant claims 14, 16, and 18:



General formula 1 shows that the Ar2 and Ar4 groups may bond at any position of the benzene ring per instant claims 2-4. With regard to instant claims 15, 17 and 19, an organic layer of the device may comprise general formula 1 with further light emitting materials, doping materials, hole injecting and electron injecting materials (see par. 51, 40-42). Hole injecting material that may be included in the layer with the general formula 1 compound (see par. 51) may include triphenylamines of the styrylamine type (see par. 43, page 19).

Regarding claims 26-28, the Ar groups may include a 9-phenanthryl group (see page 8):

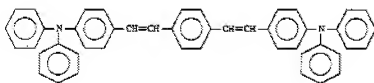


Although Ikeda et al. do not set forth an asymmetric compound as an *example* compound representing general formula 1, it would have been obvious to one of ordinary skill in the art at the time of the invention to have formed an asymmetric compound according to general formula 1, because Ikeda et al. teach Ar2 and Ar4 may be selected *independently* from one another and any bonding position on the benzene rings may be present, which would result in asymmetric compounds. One would expect the formation and use of an asymmetric compound according to general formula 1 to result in a device having excellent efficiency of light emission and heat resistance as taught, because such a compound is within the teachings of Ikeda et al. as a desirable material for forming an organic layer of an organic electroluminescent element.

9. Claims 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al. (EP 1333018 A1) in view of Hosokawa et al. (US 5,536,949).

Ikeda is relied upon as set forth above.

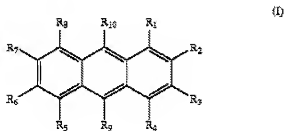
Ikeda et al. teaches the use of triphenylamine compounds for hole charge injection in the devices (see par. 44-45, page 20), but does not expressly set forth the specific distyrylamine derivatives of instant claims 29-31. Hosokawa et al. teaches in analogous art amine compounds such as the following (see col. 13-14):



Specific D1 to D12 groups corresponding to the general formulas (see col. 4 and col. 6, lines 39 to end of column) include phenyl groups having a methyl substituent. Although meta positioned methyl groups are not exemplified, it would have been obvious to one of ordinary skill in the art to have formed a distyrylamine such as the above compound and to have substituted the outermost phenyl groups with methyl groups in the meta position of the phenyl groups and to have formed a device according to Ikeda et al. comprising the distyrylamine, because Hosokawa sets forth methyl substituted groups. One would expect the meta substituted amine compound to provide the function of charge injection in a device with a predictable result.

10. Claims 2-4 and 14-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cosimbescu et al. (US 2005/0089715 A1).

Cosimbescu et al. discloses asymmetric anthracene compounds for an OLED device (see title and abstract) resulting in improved device stability (see par. 14). The general formula for the asymmetric anthracene compounds is the following (see par. 8 and 16):



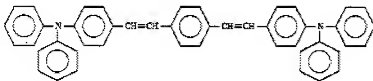
In the above formula, R is a biphenyl group (see par. 12). The biphenyl may be present where the outermost phenyl of the bi-phenyl is substituted para, meta or ortho to the other phenyl (see Inv compounds par. 22). R10 of the above formula I is a phenyl group that is ortho or meta substituted (see par. 18). Suitable substituent groups for the R10 phenyl include phenyl,

naphthyl, phenanthryl and pyrenyl (see par. 18). Although the exemplified compounds of Cosimbescu et al. have been excluded from the present claims, Cosimbescu et al. renders obvious the formation of asymmetric anthracene compounds according to instant formulas (2), (3), and (4) for a light emitting device. It would have been obvious to one of ordinary skill in the art at the time of the invention to have formed asymmetric compounds for a device having the required groups at the R9 and R10 positions, because Cosimbescu et al. teaches such compounds as suitable for achieving a device with superior stability. One would expect the compounds to be functional for the device with a predictable result.

11. Claims 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cosimbescu et al. (US 2005/0089715 A1) in view of in view of Hosokawa et al. (US 5,536,949).

Cosimbescu et al. is relied upon as set forth above.

Cosimbescu et al. teaches the use of distyrylamine compounds use with the host compounds in the EL devices (see par. 25), but does not expressly set forth the specific distyrylamine derivatives of instant claims 29-31. Hosokawa et al. teaches in analogous art amine compounds such as the following (see col. 13-14):



Specific D1 to D12 groups corresponding to the general formulas (see col. 4 and col. 6, lines 39 to end of column) include phenyl groups having a methyl substituent. Although meta positioned methyl groups are not exemplified, it would have been obvious to one of ordinary skill in the art

to have formed a distyrylamine such as the above compound and to have substituted the outermost phenyl groups with methyl groups in the meta position of the phenyl groups and to have formed a device according to Cosimbescu comprising the distyrylamine, because Hosokawa sets forth methyl substituted groups. One would expect the meta substituted amine compound to provide the function of charge injection in a device according to Cosimbescu with a predictable result.

***Response to Arguments***

12. Applicant's arguments filed June 14, 2011 have been fully considered but they are not persuasive.

Applicant's arguments with regard to the previous 35 U.S.C. 102(e) rejection over Cosimbescu are now moot, since the anticipation rejection has been overcome by the amendment filed June 14, 2011.

Applicant argues Cosimbescu and Ikeda fail to disclose or suggest modifying the anthracene derivatives to arrive at the asymmetric monoanthracene derivatives of instant formulas (2) to (4). The examiner maintains Ikeda and also Cosimbescu teach the required components of the claimed derivatives. Furthermore, Cosimbescu discloses that asymmetric anthracene compounds exhibit improved stability over previously used symmetric anthracenes (see par. 6, 7 and 14 and comparison examples). Cosimbescu teaches in the prior art that formation of asymmetric anthracenes for use in a light emitting device provide the result of improved performance. Accordingly, the improvement in using asymmetric anthracenes is an expected rather than an unexpected result of improved stability, since the result is taught in the

prior art. Applicant alleges the comparative experimental data presented in Table 1 of the present specification shows superior properties. The examiner submits the experimental data is limited to a few example compounds and comparative compounds used in a very specific device structure. The data is considered insufficient to overcome the compound claims that encompass a much larger number of compounds than those tested and are not limited to use in a device structure. Also, the examples combine the anthracene derivatives with a very specific “D1” styrylamine compound in the luminescent layer. None of the claims limit the device to the “D1” compound or limit the inventive anthracene derivatives to a particular layer of an OLED. The examples are not considered to be fully commensurate in scope with the breadth of the claimed subject matter. Applicant’s examples in Table 1 comprise five compounds that include a limited combination of substitution patterns (i.e., ortho, meta and para) and select aryl groups. Applicant claims a variety of substitution patterns, number of aryl groups on the benzene rings and a large group of aryl groups having 6 to 50 nuclear carbon atoms. Clearly unexpected, superior results with respect to the claims have not been demonstrated and as noted above, the prior art demonstrates one of ordinary skill in the art at the time of the invention would have already recognized improved stability by using an asymmetric anthracene versus a symmetric anthracene based upon the teachings and showing of Cosimbescu et al. in the prior art.

Regarding applicant’s argument that Ikeda teaches a tremendously large genus of derivatives, the examiner submits the fact that a reference “discloses a multitude of effective combinations does not render any particular formulation less obvious.” *Merck & Co., Inc. v. Biocraft Labs*, 874 F.2d 804, 808 (Fed. Cir. 1989) *In re Corkill*, 771 F.2d 1496, 1500 (Fed. Cir. 1985) (obviousness rejection of claims affirmed in light of prior art teaching that “hydrated

zeolites will work” in detergent formulations, even though “the inventors selected the zeolites of the claims from among ‘thousands’ of compounds”)); *see also*, *In re Susi*, 440 F.2d 442, 445 (CCPA 1971) (obviousness rejection affirmed where the disclosure of the prior art was “huge, but it undeniably include[d] at least some of the compounds recited in appellant’s generic claims and [was] of a class of chemicals to be used for the same purpose as appellant’s additives.”). Furthermore, “[A] reference disclosure must be evaluated for all that it fairly [teaches] and not only for what is indicated as preferred.” *In re Bozek*, 416 F.2d 1385, 1390 (CCPA 1969). Non-preferred embodiments can be indicative of obviousness (see *In re Lamberti*, 192 USPQ 278 (CCPA 1976); *In re Boe*, 148 USPQ 507 (CCPA 1976); *In re Kohler*, 177 USPQ 399 (CCPA 1973)), and a reference is not limited to working examples (see *In re Fracalossi*, 215 USPQ 569 (CCPA 1982)).

In response to applicant’s argument that the examiner’s conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant’s disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Applicant argues a reference must be considered in its entirety and suggest that Ikeda demonstrates the exemplified symmetrical anthracene derivatives exhibit high efficiency light emission and high heat resistance. Applicant alleges derivatives of instant formula (1) do not appear to exhibit high heat resistance. The examiner notes that a particular method of

depositing material (one relying on a deposition temperature) is not claimed and none of the claims are limited to a process for forming a layer of the anthracene. Also, Cosimbescu provides data showing use of unsymmetrical monoanthracenes in a device provides better performance and greater stability (see experimental data, especially paragraph 167). Applicant's arguments with regard to unexpected results have not been found persuasive.

### *Conclusion*

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dawn L. Garrett whose telephone number is (571)272-1523. The examiner can normally be reached Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer Chriss can be reached on (571) 272-7783. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dawn L. Garrett/  
Primary Examiner, Art Unit 1786

September 23, 2011